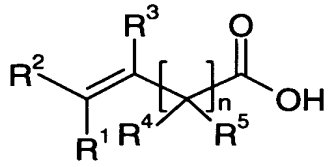
Claims

1. A composition for treating metal surfaces, comprising

a) at least one copolymer as component A, synthesized from

aa) 50 to 99.9% by weight of (meth)acrylic acid or salts thereof as component Aa;

ab1) 0.1 to 50% by weight of a carboxylate-containing monomer of the formula I



(I)

in which the symbols have the following definitions:

n is 0 to 10,

R^1, R^2, and R^3 independently of one another are hydrogen, C_1 to C_{18} alkyl, which may be branched or unbranched, C_3 to C_6 cycloalkyl, C_2 to C_{18} alkenyl, which may be branched or unbranched, C_3 to C_6 cycloalkenyl, C_6 to C_{12} aryl, which may be substituted by alkyl substituents or other aryl substituents, it being possible for the stated radicals R^1, R^2 and/or R^3 optionally to be substituted by at least one carboxyl group, or are a carboxyl group;

R^4 and R^5 are independently of one another hydrogen, C_1 to C_{18} alkyl, which may be branched or unbranched, C_3 to C_6 cycloalkyl, C_2 to C_{18} alkenyl, which may be branched or unbranched, C_3 to C_6 cycloalkenyl, C_6 to C_{12} aryl, which may be substituted by alkyl substituents or other aryl substituents; or salts, anhydrides, esters of compounds of the formula I, with the exception of

(meth)acrylic acid, with the exception of (meth)acrylic acid or salts thereof, as component Ab1;

and/or

ab2) 0.1 to 50% by weight of monomers containing groups containing phosphoric and/or phosphonic acid or salts thereof, as component Ab2, and polymerizable with the monomers specified under aa) and ac), and also with component Ab1;

ac) 0 to 30% by weight of further comonomers polymerizable with the monomers specified under aa) and ab), as component Ac;

b) water or another solvent capable of dissolving, dispersing, suspending or emulsifying the polymer (component A), as component B;

c) where appropriate, further surface-active additives, dispersants, suspension agents and/or emulsifiers as component C.

2. A composition according to claim 1, wherein component Aa is acrylic acid or a salt of acrylic acid, component Ab1 is maleic anhydride, and component Ab2 is vinylphosphonic acid or methacrylic acid phosphonoxyethyl ester.

3. A composition according to claim 1 or 2, wherein as component A a copolymer synthesized from acrylic acid and maleic anhydride or a terpolymer synthesized from (meth)acrylic acid, maleic anhydride, and vinylphosphonic acid is used.

4. A composition according to one of claims 1 to 3, comprising further to components A, B, and, where appropriate, C

ad) at least one nitrogen base, preferably at least one tertiary alkaline amine, more preferably at least one hydroxylamine, 3-dimethylaminopropylamine and/or imidazole, as component D.

5. A composition according to one of claims 1 to 4, comprising further to components A, B, where appropriate C, and, where appropriate, D

e) at least one salt, acid or base based on transition metal cations, transition metal oxo anions, fluorometallates or lanthanoids as component E,

and/or

f) at least one acid or one alkali metal or alkaline earth metal salt of said acid selected from the group consisting of phosphoric acid, sulfuric acid, sulfonic acids, formic acid, acetic acid, nitric acid, hydrofluoric acid, and hydrochloric acid, as component F,

and/or

g) at least one further corrosion inhibitor as component G,

and/or

h) compounds of Ce, Ni, Co, V, Fe, Zn, Zr, Ca, Mn, Mo, W, Cr and/or Bi as component H,

and/or

i) further auxiliaries and additives as component I,

and/or

j) at least one complexing agent as component J,

and/or

k) further additives as component K.

6. A passivating layer on a metal surface, obtainable by contacting the metal surface with a composition comprising a polymer according to one of claims 1 to 3 (component A).

7. A passivating layer according to claim 6, whose thickness is ≤ 3 µm.

8. A surface composed of a metal surface and a passivating layer according to claim 6 or 7.

9. A process for forming a passivating layer on a metal surface, wherein the metal surface is contacted with a composition according to one of claims 1 to 5.

10. A process according to claim 9, wherein said contacting is effected by spraying, rolling or dipping methods.

11. The use of a composition according to one of claims 1 to 5 to passivate a metal surface.

12. A system on a metal surface comprising a passivating layer X according to claims 6 or 7 and further coating films Y.

13. A process of forming a coating system according to claim 12, comprising the steps of:

- forming a passivating layer X by a process according to claim 9 or 10;
- coating the passivating layer.